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CASE REPORT

Transient leukoerythroblastosis in a very low birth weight infant with parvovirus B19 infection

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KEYWORDS

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Summary

Background: Leukoerythroblastosis is characterized by the presence of leukocytosis and erythroid and myeloid blast cells in the peripheral blood. The most common etiological factors of leukoerythroblastosis occurring during early childhood are viral infections, juvenile myelomonocytic leukemia, and osteopetrosis. To our knowledge, an association with parvovirus B19 infection has only been reported in a preterm infant. Human parvovirus B19 has been associated with red cell aplasia, leukopenia, and thrombocytopenia.

Case report: The case of a very low birth weight preterm infant with transient leukoerythroblastosis associated with parvovirus B19 infection is described.

Conclusions: Leukoerythroblastosis has to be kept in mind if a very high leukocyte count is detected in the neonatal period, and parvovirus B19 infection should be taken into consideration as the etiological factor for this entity.

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Introduction

Leukoerythroblastosis is an uncommon disease characterized by the presence of leukocytosis and erythroid and myeloid blast cells in the peripheral blood. It has been reported in association with juvenile myelomonocytic leukemia, hemolytic anemia, osteopetrosis, myelofibrosis, and neuroblastoma in the newborn and during childhood.^{1,2} The most common etiological factors for leukoerythroblastosis occur-

ring during early childhood are viral infections, juvenile myelomonocytic leukemia, and osteopetrosis. Human parvovirus B19 infection has been associated with red cell aplasia, leukopenia, and thrombocytopenia. Parvovirus B19 infects the erythroid progenitor cells and causes transient erythroblastopenia and may present as erythema infectiosum in children. However, a transient increase in leukocyte and platelet counts has also been reported.^{1,3,4} Leukoerythroblastosis has been reported in association with infection by parvovirus B19 in a preterm infant.¹ We describe herein the case of a very low birth weight (780 g) infant who had a high leukocyte count with transient leukoerythroblastosis associated with parvovirus B19 infection.

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Case report

A preterm male infant was born vaginally at 26 weeks of gestation to a 35-year-old gravida 1 mother. His mother had been followed-up routinely by her private obstetrician, had shown a normal pregnancy course until delivery, and had received antenatal steroids for the prevention of respiratory distress syndrome. Apgar scores were 4 at 1 minute and 6 at 5 minutes. His birth weight was 780 g (10–50th percentile), height 32 cm (10–50th percentile), and head circumference 23 cm (10–50th percentile). On admission to our neonatal unit, the infant was tachypneic and had severe retractions, nasal flaring, and grunting. A chest radiograph showed opaque lungs; therefore one dose of surfactant was administered within 1 hour after birth and he was put on mechanical ventilation. Routine laboratory measurements revealed hyperleukocytosis ($140 \times 10^9/\text{L}$) and mild anemia (hemoglobin 11.2 g/dL and hematocrit 34.4%). His platelet count was normal. The peripheral blood smear showed 3% myeloblasts, 2% promyelocytes, 3% myelocytes, 25% metamyelocytes, 8% band, 40% neutrophils, 12% lymphocytes, 5% monocytes, 2% eosinophils, 9% orthochromatophilic erythroblasts, and 2%

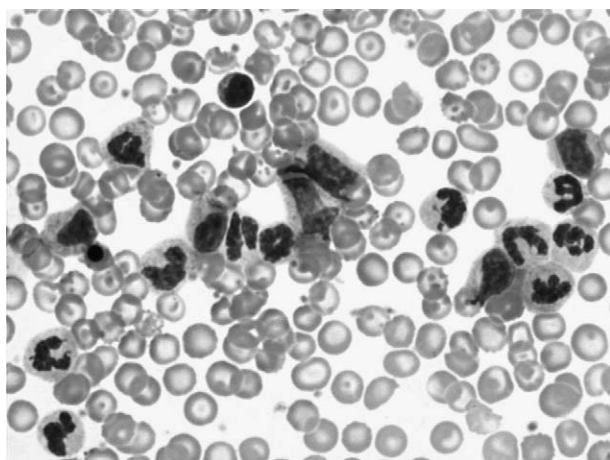


Figure 1 Peripheral blood smear shows leukocytosis and erythroid blast cells (4×10^2).

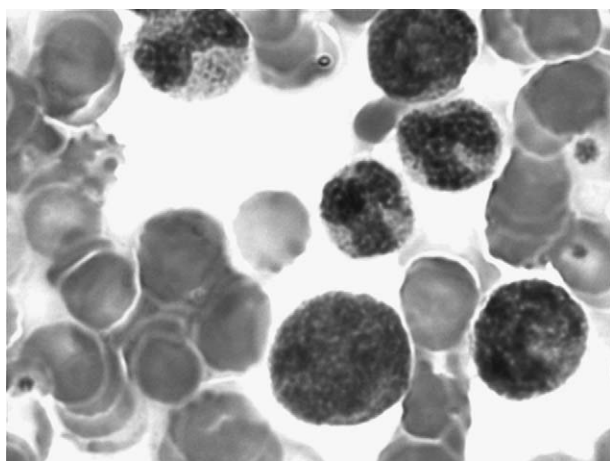


Figure 2 Peripheral blood smear shows leukocytosis and myeloid blast cell (10×10^2).

polychromatophilic erythroblasts (Figures 1 and 2). The peripheral blood smear suggested leukoerythroblastosis with the presence of severe leukocytosis, erythroblastosis, and myeloblastosis. The absolute reticulocyte count was found to be $69.4 \times 10^9/\text{L}$. The direct Coombs test was negative and bilirubin levels were within the normal range. On bone marrow aspiration, cellularity and cytogenetic examination were normal. Parvovirus B19 IgM and IgG serology was positive (1/16) on day 2 and week 2 of life, both in the mother and the baby. The serological diagnosis of parvovirus B19 infection was performed by immunofluorescence assay (IFA) method (Biotrin, Dublin, Ireland). TORCH panel and Epstein–Barr virus serology were negative. Leukocyte count and peripheral blood smear results became normal at day 10. However he continued to require ventilatory support and developed chronic lung disease at week 4 of life. He is currently 55 days old and remains on continuous mechanical ventilatory support.

Discussion

The hematological profile of our case was interpreted as severe leukocytosis and mild anemia. The peripheral blood smear suggested leukoerythroblastosis with the presence of severe leukocytosis, erythroblastosis, and myeloblastosis. Hemolytic anemia was ruled out because reticulocytosis was absent, the direct Coombs test was negative, and bilirubin levels were within the normal range. Preterm delivery and leukoerythroblastosis were considered to have developed secondary to parvovirus B19 infection.

Leukoerythroblastosis is a clinical manifestation observed rarely during childhood, with various etiological factors. The etiological factors during early childhood are congenital–postnatal viral infections, juvenile myelomonocytic leukemia, myelofibrosis, and osteopetrosis.^{1,2,5} Acute parvovirus B19 infection may present as erythema infectiosum in children. Parvovirus B19 infects the erythroid progenitor cells and causes transient erythroblastopenia and is usually associated with red cell aplasia, leukopenia, and thrombocytopenia. However, transient increases in leukocyte and platelet counts have also been reported.^{3,4}

In the literature, leukoerythroblastosis has been reported in only one 1164 g preterm infant in association with parvovirus B19 infection; the infant had a leukocyte count of $85 \times 10^9/\text{L}$ at 29 weeks of gestation.¹ Our case also had a very high leukocyte count ($140 \times 10^9/\text{L}$) with leukoerythroblastosis. A malignant etiology and osteopetrosis were not taken into consideration because of normal findings on cytogenetic analysis and the absence of severe anemia, thrombocytopenia, and hepatosplenomegaly. Myelomonocytic leukemia was ruled out as the leukocyte count and peripheral smear results regressed spontaneously.¹ It has recently been reported that infections such as parvovirus B19 developing in pregnancy may have a severe course.^{6,7} In our case, preterm delivery and leukoerythroblastosis were considered to have developed secondary to intrauterine parvovirus B19 infection.

Chronic lung disease has recently been reported in cases with a leukocyte count greater than $50 \times 10^9/\text{L}$. Leukocytosis in the first days of life may reflect the presence of an intrauterine infection, triggering the development of chronic lung disease after birth.^{8,9} The development of chronic lung disease in our case supports this suggestion.

In conclusion, we have described the case of a preterm infant with transient leukoerythroblastosis associated with parvovirus B19 infection. Leukoerythroblastosis has to be kept in mind if a very high leukocyte count is detected in the neonatal period, and parvovirus B19 infection should be taken into consideration as the etiological factor for this entity.

Conflict of interest: No conflict of interest to declare.

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